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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/826,522

04/16/2004

Geert Plaetinck

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EXAMINER

SHIN, DANA H

ART UNIT

PAPER NUMBER

1635

MAIL DATE

DELIVERY MODE

04/23/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/826,522	<b>Applicant(s)</b> PLAETINCK ET AL.	
	<b>Examiner</b> DANA SHIN	<b>Art Unit</b> 1635	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 30-41, 70-74 and 80-83 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 30-41, 70-74 and 80-83 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1-30-09</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Status of Application/Amendment/Claims***

This Office action is in response to the communications filed on January 30, 2009.

Currently, claims 30-41, 70-74, and 80-83 are pending and under examination on the merits in the instant case.

The following rejections are either newly applied or are reiterated and are the only rejections and/or objections presently applied to the instant application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Response to Arguments and Amendments***

#### **Withdrawn Rejections**

Any rejections not repeated in this Office action are hereby withdrawn.

#### **Maintained Rejections**

#### ***Claim Rejections - 35 USC § 103***

Claims 30-41, 70-74, and 80-83 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Fire et al., Noren et al., Conkling et al., and Talkad et al. for the reasons of record as set forth in the Office action mailed on August 1, 2008 and for the reasons stated below.

Art Unit: 1635

Applicant's arguments filed on January 30, 2009 have been fully considered but they are not persuasive. Applicant argues that the WO Fire et al. document does not extend to the US priority filing date of 60/068,562 because the US provisional application fails to disclose a construct comprising "promoters" flanking a DNA, nor does it disclose that a double stranded RNA "can be produced *in vivo* in a micro-organism". First, the priority document was never alleged to disclose a structure comprising two promoters flanking a DNA sequence in the previous Office action. Such deficiency was rightfully acknowledged and, as a results, a secondary reference disclosing the utility of bi-directional promoters flanking a DNA sequence (see Noren et al.) was cited in rejecting the claims. Second, contrary to applicant's argument that the US provisional application of Fire et al. does not disclose that double-stranded RNA *can* be produced *in vivo* in a micro-organism, the priority document expressly disclosed the following: "RNA may be synthesized either *in vivo* or *in vitro*...For transcription from a transgene in vivo or an expression vector, a regulatory region (e.g., promoter, enhancer, silencer) is used to transcribe the RNA strand(s)" (see page 7); "The use and construction of an expression vector are known in the art" (see page 11); "A viral vector packaged into a viral particle would accomplish both efficient introduction of an expression vector into the cell and transcription of RNA encoded by the expression vector." (see page 12); "A method to inhibit expression of a target gene in a cell comprising introduction of a ribonucleic acid (RNA) into the cell", "in which the RNA has two separate complementary strands" "further comprising synthesis of the two complementary strands and initiation of RNA duplex formation INSIDE the cell.", "in which an expression vector in a cell produces the RNA" (see claims 1, 14, 16, 20); "The cell with the target gene may be derived from or contained in any organism (e.g., plant, animal, fungus or

Art Unit: 1635

yeast). (see pages 7, 11). Hence, the disclosure of 60/068,562 provides adequate support for the disclosure of the WO document relied on in the present rejection.

Applicant further argues that Noren et al. do not teach simultaneously transcribing both sense and antisense strands by two promoters. Contrary to applicant's argument, Noren et al. taught that their invention provides "a pair of opposing modified RNA polymerase promoters such as T7 promoters to allow in vitro transcription of either strand of a cloned insert with a single polymerase, e.g., T7 RNA polymerase. Both promoters are recognized, and transcription is initiated, by a single species of RNA polymerase." See column 2, lines 14-21. Further, the teachings of Noren et al. as a whole suggest that each of the opposing bi-directional promoters flanking a DNA sequence is able to transcribe each strand of the inserted DNA sequence as evidenced by claim 1, which teaches that one promoter allows "unidirectional transcription" when the other promoter is rendered inoperable. As such, the teachings of Noren et al. suggest that fully operable two promoters in opposite direction are capable of transcribing the two strands of the flanked DNA sequence, thereby producing the DNA transcript product, double-stranded RNA.

Applicant asserts that there was no "need, reason, or motivation to make the invention as claimed" by modifying the double-stranded RNA of Fire et al., wherein two strands are separately synthesized and annealed to form the duplex RNA. It is noted that the *KSR* decision forecloses the argument that a specific teaching, suggestion or motivation is required to support a finding of obviousness. See the recent Board decision *Ex parte Smith*, --USPQ2d--, slip. op at 20, (Bd. Pat. App. & Interf. June 25, 2007) (citing *KSR*, USPQ2d at 1396) (available at <http://www.USPTO.gov/web/offices/dcom/bpai/prec/fd071925.pdf>). Further, contrary to

Art Unit: 1635

applicant's assertion, Fire et al. explicitly taught that one can produce double-stranded RNA inside a cell by introducing an expression vector carrying a promoter that transcribes the RNA strands and moreover disclosed that producing or synthesizing intended nucleic acids inside a cell with an expression vector is an art-accepted methodology for *in vivo* expression of the nucleic acids inside a cell. Further, Fire et al. taught that "each" of the two strands of the double-stranded RNA can be synthesized and form a duplex inside a cell. Since Noren et al. taught one can utilize an expression vector comprising bi-directional promoters that synthesize the nucleic acid of each direction when both promoters are operable, one of ordinary skill in the art would have been sufficiently motivated to utilize the bi-directional vector construct of Noren et al. in making the expression vector system that can synthesize each of the two strands of an interfering double-stranded RNA of Fire et al. and produce the double-stranded RNA inside a cell.

Applicant further argues that one would not have had a reason to combine the teachings of the cited prior art reference to make or use a microorganism that produces double-stranded RNA as claimed because none of them teaches production of double-stranded RNA in microorganism. Contrary to applicant's argument, Fire et al. taught production of double-stranded RNA in a cell of any organism. There is no teaching in the Fire et al. reference (supported by provisional application) that excludes "microorganism" from any organism taught by Fire et al. In fact, Fire et al. expressly taught that one can express double-stranded RNA in a cell of yeast or fungus. Moreover, it is a scientific fact that microorganisms do possess cells, and therefore, it would have been obvious to one of ordinary skill in the art to produce double-stranded RNA via bi-directional expression vector inside cells of microorganisms, and

Art Unit: 1635

furthermore, dosing so would have been fully within the technical grasp and capabilities of the ordinary skilled artisan at the time the invention was made.

In view of the foregoing, it is concluded that applicant's arguments do not clearly point out the patentable novelty which he or she thinks in view of the state of the art disclosed by the references cited. Hence, this rejection is maintained.

### ***Conclusion***

No claim is allowed.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANA SHIN whose telephone number is (571)272-8008. The examiner can normally be reached on Monday through Friday, 7am-3:30pm EST.

Art Unit: 1635

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James (Doug) Schultz can be reached on 571-272-0763. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dana Shin  
Examiner  
Art Unit 1635

/J. E. Angell/  
Primary Examiner, Art Unit 1635